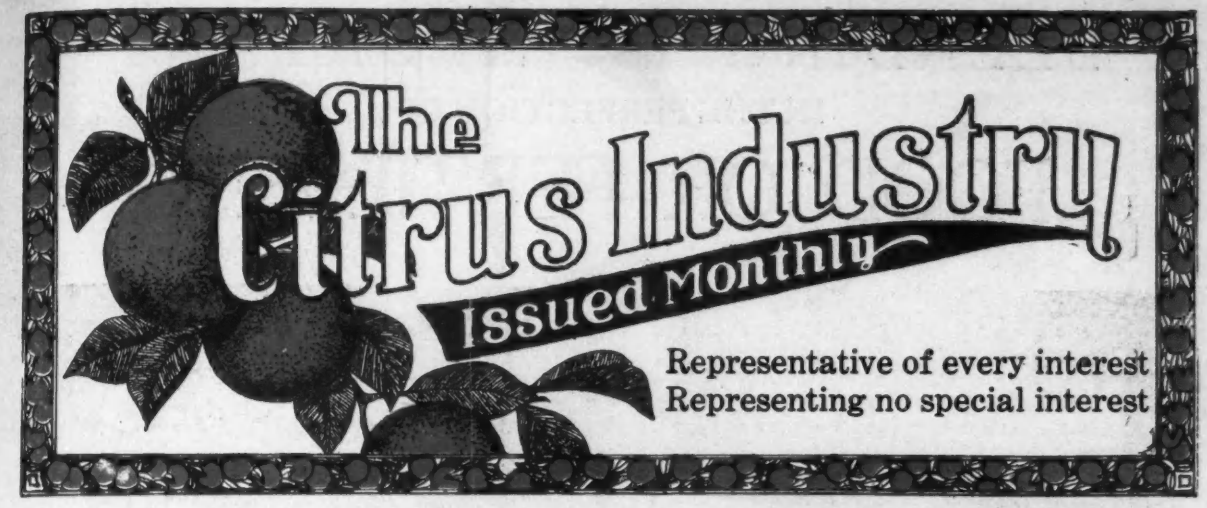

Vol. 14, No. 5 TAMPA, FLORIDA, MAY, 1933 15 Cents a Copy

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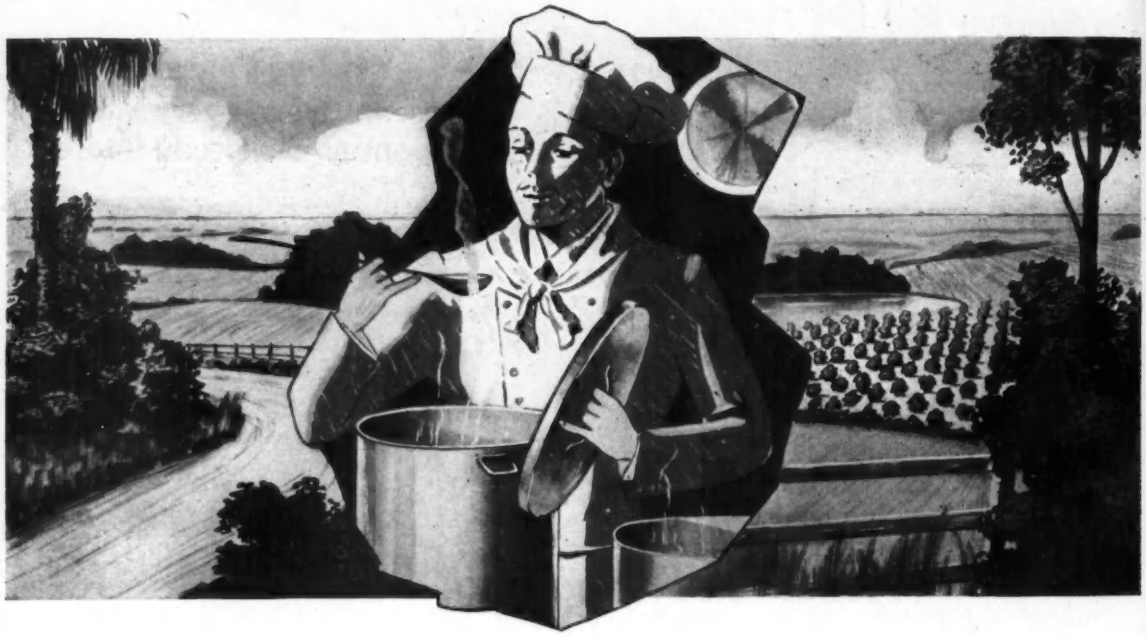
BLENDING IS IMPORTANT

IN THE PERFECTION OF

FOOD OR FERTILIZER



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MOST VALUE PER DOLLAR

IDEAL FERTILIZERS

Features In This Month's Issue

The Citrus Industry
EXCLUSIVE SPECIALIZED CITRUS PUBLICATION
Issued Monthly
Representative of every interest
Representing no special interest

Vol. 14 TAMPA, FLORIDA, MAY 1933 No. 5

Economic Facts Relative To 33 Grove Caretaking Businesses for 1929

By J. E. TURLINGTON and H. W. HAWTHORNE, Agricultural Economists,
Bureau of Agricultural Economics, U. S. D. A.

Introduction

The care of citrus groves in Florida for others has become an important business. Calculations indicate that no less than 6,000 persons who live outside of the state own groves in Florida. Not only these groves are taken care of by caretakers, but many people residing within the state who own groves have practically no grove equipment, workstock or other forms of power. These resident owners, many of whom live in town, but some of whom reside at the grove, employ caretakers to care for their groves.

A number of caretaking businesses have been developed along with the development of groves for sale, it being necessary to make some arrangement to care for the groves sold to outsiders, as well as to care for the unsold groves.

In other cases those who owned groves frequently found that they could care for one or more additional groves with the same workstock, tractors, dusters and other equipment necessary to care for their own groves, and perhaps with but little extra labor. Frequently, by a small investment in additional workstock and some extra labor, the grove owner is able to care for several 5 to 20 acre tracts in addition to his own.

In some instances the business of caring for groves has been established by those who neither owned groves nor were in the grove development business.

Some individual grove owners who live at or near their groves do a great deal of shopping around and attempt to get each job done at the lowest price possible. Perhaps one caretaker or grove owner will do his spraying, another his disking, and so on.

Realizing the importance of the caretaking business to the citrus industry of the state, the College of Agriculture, in cooperation with the Bureau of Agricultural Economics, U. S. D. A., made a study of the business of 33 caretakers for the year 1929.

Location of Businesses

The 33 businesses studied were confined to 12 in Lake County and 21 in Polk County.

Size of Business

The size of the businesses as measured by the number of acres in groves cared for was as follows: Ten cared for less than 200 acres each, with an average of 124 acres per business; 12 cared for from 200 to 500 acres each, with an average of 311 acres; 11 cared for more than 500 acres each, with an average of 1,633 acres. The total acreage cared for by the 33 caretakers was 22,935 acres which belonged to 1,610 individuals or firms, 1,000 of whom lived out of the community and seldom visited their groves. Some had never seen them. Three hundred and seventy-one others resided in the community a few months during the winter, at the grove. The caretakers' organizations owned approximately one-sixth of the acreage cared for.

The percentage of the acreage of different ages was as follows: 21 percent under 5 years of age, 44 percent 5 to 10 years of age, 22 percent 11 to 15 years of age, and 13 percent over 15 years of age. The ages by the different size of business groups, are shown in Table 1. The group of larg-

TABLE 1.—Percent of Groves in Various Age Groups by Size of Business

	Under 200 Acres	200-500 Acres	Over 500 Acres	Average For The 33
Number of Businesses	10	12	11	
Age Groups:	Percent	Percent	Percent	Percent
Under 5 years	18	13	23	21
Five—10 Years	30	36	46	44
Eleven—15 Years	30	26	21	22
Over 15 years	22	25	10	13

(Continued on page 8)

A Spray Program For Citrus Trees

By R. H. LINDERMAN at State Horticulural Meeting

For several years before the appearance of the Tractor Sprayer, I had been considering the exclusive and frequent use of Lime Sulphur solution on our citrus trees but the cost with the old type mule-sprayer was prohibitive. With the perfection of the tractor and truck sprayer, I started four years ago to spray with Lime Sulphur solution on the following schedule.

On or about January 15th, or the dormant period, we spray our Grapefruit trees at a strength of 1 gallon of Lime Sulphur to 25 gallons of water. I consider this application, and at this strength, very beneficial as a reasonable control of scab in this high ridge section. Our orange trees are usually sprayed at this time also but at the more usual dilution; that is, 1 gallon of Lime Sulphur to 40 gallons of water. All subsequent applications are at this same strength. I should state that while the dilutions of material are stated in terms of the liquid form we are applying dry lime sulphur using 2 pounds as the equivalent of 1 gallon.

Our next application is made when about three-fourths of the bloom has shed and all varieties are sprayed.

General applications are made at about seven-week intervals throughout the summer until about the first of September. We find that usually one spraying after this date will keep our fruit bright until the dormant application, the following January. We are careful to make the application in July at a time when scale crawlers are most easily killed.

This is the schedule we have followed for three years and we are so well pleased with results that we have started this year with the same program.

I believe that with these regular applications of Lime Sulphur we have greatly improved the texture and color of our fruit and have reduced scale to such an extent that we have not found it necessary to apply any oil spray. This year, I believe our fruit is more free of melanose than that in groves that have not had as many applications of Lime Sulphur solution.

A few words regarding costs might be interesting.

We have just completed our bloom spray at a cost of .0214 per tree. This cost represents tractor-sprayer, labor, material and supervision at approximately cost. The total spraying cost for 1932 was .12 per tree and represents 6 applications on our grapefruit and 5 on our orange trees. Different grove caretaking organizations have various methods of charging for their spraying operations; that is, some spray at cost plus a certain fixed fee, or the spraying is charged for on the hourly basis, so I am hoping that these figures will not cause any misunderstanding to anyone.

The groves at Mountain Lake are nearly all in one group so there is practically no lost time in our spraying operations but we do have quite a distance to haul water and this is, of course, charged to the operation. We always spray with a pressure of from 400 to 450 pounds and the liquid goes on the trees in the form of a fog rather than a spray. This is particularly important during the hot summer months to avoid burning the fruit. The last spraying was applied in 628 hours and this represents the spraying of approximately 3 trees in 1 minute. We are caring for 117,-940 trees ranging from nine to eighteen years in age. Our equipment consists of 5 tractor-sprayers of 300 gallons capacity each, and one truck-sprayer of 200 gallons.

We have been asked to demonstate our spraying operation for your friendly criticism after the concert at the Singing Tower this afternoon and we will be only too glad to answer any questions, that we can, at that time.

What Our Readers Think

THE TRUCK PROBLEM

(COPY)

Fort Pierce, Florida, April 23, 1933
Representative E. C. Denison,
Tallahassee, Fla.
Dear Ed:

Just checking over our gas and oil bills preparatory to making out our annual return for our fiscal year which ends April 30th. We find we have paid State tax on the above, which we understand goes to the building and maintenance of our roads, in the amount of $268.72.

On first thought this is fine. We are glad to have done enough business to be able to pay such a tax; we need the roads and they must be kept up.

However, we noticed the other day a foreign truck which has been in the business of hauling bulk fruit to the northern markets. We observed several shovels in the equipment and if we had not known that it was in the bulk fruit business we would have taken it for some road repair truck. Then we saw two large tanks, one on each side, which would hold approximately 40 gallons each. These tanks we understand were used for reserve gasoline tanks, being filled before entering the State as our "gas costs too much with the Tax."

This struck us very forcibly and our first reaction was this: It costs us 60c to put a box of fruit in Baltimore and another 10% commission to sell it. One of our trucks can haul 100 boxes. We believe that we can haul this fruit, using cheap gasoline purchased out of the State by the simple method of using reserve tanks, at a much lower cost than this, refilling our tanks before re-entering the State and at the same time furnish this "cheap" gasoline for our other three trucks and cars to carry on our picking, hauling, and running around business. Of course we could put our fruit in standard containers only because we do not believe as yet that Florida fruit has gone down so low that it should be handled with shovels except on a trip to the incinerator.

On second thought we are not in the hauling business. We expect and are glad to pay our proportionate share to build and maintain the roads. However, we fail to see the fairness in our small company paying $268.72 to build and maintain roads to allow such competition as those who shovel fruit into trucks with reserve gasoline tanks to run over them with a free ticket. This same fruit practically ruins the market for such fruit as a grower takes pride in growing.

We understand that California does not allow this. At the same time we know that California is as far ahead

(Continued on page 23.)

Highest Returns Shown By Citrus

By K. C. MOORE, Orange County Agent in Orange Echoes

Though we are experiencing at this time some dark conditions in the Florida citrus situation, a long time look at this industry reveals a brighter prospect. After some little study of the whole picture there is reason for taking courage, and for maintaining groves in the best condition by whatever means possible. Supporting most of these reasons is the depression. In fact the depression is directly responsible for several factors influencing this opinion.

First and foremost, Florida citrus fruits have shown the highest net returns of any major farm product for the past three years. In the January issue of The Agricultural Situation, published by the United States Department of Agriculture, the "general trend of prices and purchasing power" shows an index for all groups of farm commodities of 52, and an index number for "fruits and vegetables" of 59 for December. Comparatively this ratio has obtained since 1929. It is generally known that Florida citrus fruits have an index much above this figure. In the Florida Agricultural Outlook for 1933, issued December 15, 1932, by the Agricultural Extension Service cooperating with the U. S. D. A. appears the following: "Citrus fruits have not declined in the markets at the same rate as other agricultural commodities." This would indicate that consumption has increased with production, which may be due partly to the promotion of the sale of the fruit as juice, partly to its recognized healthful food value, and partly to good advertising and merchandising.

Second, grove valuations have not been as high in Florida as they have in California. A ten acre grove does not represent as great an initial investment. Interest charges and taxes are not as high. The five year average charge for "investment overhead" as reported by 65 Orange County, California, orange growers up to and including 1930 was $177.88 per acre per year. This includes depreciation and interest. We do not have figures for the same charges for Florida groves, but from grove records that we do have we estimate that such charges would not approach this amount.

Prospective Investors

In this discussion comparisons with our competitors are not made with any idea of disparaging their advantages, but for the purpose of pointing out some of the factors that should give courage to our growers and should interest prospective investors in Florida citrus properties. Figures used are taken from official publications. One of these is "Summary of Cost of Production Study on Oranges; Orange County (California) 1930. With a Five Year Review. Compiled by The Agricultural Extension Service, University of California." Others are published by the University of Florida Agricultural Extension Service.

My third point is quoted from a statement by Mr. H. G. Clayton, District Agent, Florida Agricultural Extension Service. "Since the general break in commodity prices which began in 1929, the trend toward using orange juice coupled with good salesmanship has brought to the consumers' attention the superior juice content of Florida oranges, and this has helped to get Florida orange prices to where they are equally and in many cases selling for more than California oranges." We have a superior product in everything but color, and it is possible to produce bright fruit here at decreasing costs. Recent rust mite control experiments point to this.

Fourth, competition by water and truck and the united efforts of our shippers through their own Growers and Shippers League are helping to secure lower freight rates. The majority of the population of the United States is located in a trade area that is nearer to Florida than Texas and California, and we are gaining more of the benefit of geographical location to which we are justly entitled.

Fifth, Florida growers are being compelled to learn to cut costs of production. As a great aid to this the necessities have been lowered. Cover crops are more generally grown and prices of fertilizers and other proven such cover crops as Natal grass is now handled generally to advantage with the fuller knowledge of the processes of decay and other related phenomena.

Production Costs

Sixth, the costs of producing citrus friut as shown in the reports of thirty-nine Orange County, Florida, growers averaged $90.34 per acre for the season 1930-31.

Since this is the average price of these growers it is self evident that many of them are producing fruit at a very much lower cost. It is also evident that others can and should follow their lead. Several of them have been doing so in the past two seasons.

The items included are fertilizers and fertilizing, spraying and dusting, pruning, mowing, hired supervision, taxes and miscellaneous, but not interest on investment or depreciation. As compared to this the costs for the five year period from 1926 to 1930 of the same items for Orange County, California, averaged $222.53 per acre per year. As already pointed out the average per acre costs are being somewhat reduced, and the same rate of reduction should apply in both states. It is difficult to see how California growers can be making any profit or breaking even when we review the market prices for the past two or three years. The studies referred to show that their average yields are about the same as ours.

In this connection it is interesting to note that Orange County growers spent an average of $60.42 for fertilizers and mulching materials; Orange County, Florida, growers spent $43.01 per acre for fertilizers. We have no figure for mulching in the Florida groves reporting. They have an irrigation cost of $14.08. Most of our groves are not irrigated, but the per acre costs are not nearly so high on those that have this facility. It has been found very profitable in Florida to irrigate in some seasons with proper equipment, and more of our groves should have this kind of equipment.

Seventh, weather bureau records show that Texas has more damaging cold weather than Florida. This is a factor that we should bear in mind in any consideration of the grapefruit situation.

Production of citrus fruits in foreign countries is increasing. This is a factor to be reckoned with in the Canadian and other foreign markets, though it will likely have little if any bearing on the United States markets. Attention may well be called here to the development of new kinds of citrus adapted to Florida. The Hamlin orange is being planted more extensively. It is superior early fruit The

(Continued from page 7)

ECONOMIC FACTS RELATIVE TO THIRTY-THREE GROVE CARETAKING BUSINESSES FOR 1929

(Continued from page 5)

er businesses had a larger percentage of the younger ages than the smaller businesses, and they were more often associated with the business of developing groves for sale.

Investment

The total investment in these 33 caretaking businesses excluding groves owned by the caretakers, was $340,194 on January 1, 1929. This was made up of $160,893 in real estate (mainly buildings for worstock and equipment and dwellings for employees); $127,776 in grove equipment, including automobiles, work harness, tools and other equipment; and $51,525 in workstock. To have equipped the 33 businesses with new equipment, buildings and other items throughout would have required an investment of one-third to one-half more, or approximately $500,000. In other words, the investment per acre was nearly $15, and if replaced with new equipment and buildings would have exceeded $20 per acre.

Table 2 shows by items how the average investment per acre of groves cared for was distributed. The businesses were grouped into three sizes as discussed under size of business. Real estate constituted slightly more than 50 percent of the investment for the group of larger businesses while it was less than 1-3 on the two smaller groups. This was due in part to the fact that the larger businesses generally had proportionately much more tied up in buildings used for housing the hired help, foreman, and even the hired manager in a few cases. They also had more or less elaborate offices, but these were not always owned, and in that case are not included in investment. On the other hand the smaller business generally had very little invested in quarters for hired help, and the majority of them did not have any dwellings included in the caretaking business. One of those just under 200 acres had elaborate barns and a dwelling for a hired foreman out of all proportion to what was necessary, and this made the group of businesses under 200 acres average more invested in real estate per acre of grove cared for than would otherwise have been the case.

The investment in equipment, including everything except work animals and real estate, was $10.98 per acre for businesses of under 200 acres; $6.24 for those 200 to 500 acres, and $5.06 for those with over 500 acres in grove. Miscellaneous equipment included such items as farming equipment, hoes, axes, pitchforks, and the like. The pruning equipment, however, was frequently owned by the hired man who was employed to do the pruning. The investment in pruning equipment other than that owned by the caretakers would probably not exceed 5c per acre.

Cost

The cost to the 33 caretakers for 1929 for labor, supervision, power and use of equipment, including depreciation but not including interest on investment, insurance and taxes, was approximately $611,447, or $26.66 per acre. An interest charge of 7 percent on investment at the beginning of the year would add $1.04, making a total of $27.70 per acre. The costs as used here did not include any materials used on the groves such as fertilizer, spray, dust, bluestone, trees for replacement, or other items which were purchased by the owner of the grove direct, or which the caretaker purchased for him. The division of the cost, which did not include taxes and insurance, was approximately 70 percent for labor and supervision, 9 percent for use of workstock, including feed, 8 percent for gas and oil, 7 percent for use of equipment and office supplies, 4 percent for interest on investment, and 2 percent for the use of real estate. This is given in detail in Table 3.

The cost of machinery was calculated as follows: All purchases of machinery and costs of repairs were added to the inventory value at the beginning of the year, and from this were subtracted the products of receipts from sales of machinery and the inventory value at the end of the year.

The cost per acre to the caretakers was greatest for the group of smallest size businesses and least for the group of medium size. The principal difference in the costs for these two groups of businesses occurred in the combined cost of labor and supervision. For the large businesses, this amounted to $19.92; for the businesses of medium size $15.46; and for the smaller businesses $23.80.

The supervision charge on the larger businesses, includes salaries of managers, bookkeepers, and field foremen who do little or none of the actual work in the grove. For the businesses of medium and smaller size, however, the managers and foremen often do considerable work themselves. They frequently operate the tractors, spray machines and the like. Therefore, the division of labor and supervision as shown in the table is not very accurate, but the total labor and supervision charge in the table included the manager's salary, whether owner or hired manager, and whether he actually operated equipment and performed labor in the grove himself or merely supervised the work done.

There was in reality a greater discrepancy between the costs of the businesses of medium and large size than is indicated in the figures in Table 3, because there was 20 percent more of the acreage under the age of 11 in the group of larger businesses. Other studies indicate, and it is generally acknowledged, that it requires more labor and power for groves over 10 years of age than it does for those under 10 years of age. It should be further stated that had all the acreage been 10 years old or more, the total costs per acre to the caretakers for labor, supervision, power and use of equipment would have been more than the figures indicate in Table 3.

Methods of Charges

The methods of charging were far from standardized, and varied greatly, from a flat rate per acre including all materials, power, supervision and labor, to charges by the day, acre or tree for each operation, the owner furnishing or paying for all spray,

TABLE 2.—Average Investment in the Caretaker Business Per Acre at Beginning of Year in Workstock, Equipment, and Real Estate, 33 Caretakers in Lake and Polk Counties, Florida, 1929.

Item	Under 200 Acres	200-500 Acres	Over 500 Acres	Average For 33
Number of Caretakers	10	12	11	33
Acres Per Caretaker	124	311	1,633	695
Work Animals	$2.79	$1.94	$2.27	$2.25
Real Estate	5.65	3.71	7.80	7.01
Tractor	1.41	1.04	.92	.97
Truck	1.69	1.00	.63	.75
Wagons and Trailers	.50	.31	.25	.27
Plows	.37	.26	.13	.16
Disc Harrows	.31	.23	.19	.21
Acme Harrows	.28	.15	.14	.15
Mowers	.21	.14	.14	.14
Hay Rakes	.06	.02	.03	.03
Sprayers	1.88	1.00	1.02	1.06
Dusters	.68	.55	.30	.36
Autos	2.52	1.05	.78	.92
Work Harness	.17	.08	.15	.14
Motors	.22	.27	.06	.10
Miscellaneous Equipment	.68	.14	.32	.31
Total Equipment	10.98	6.24	5.06	5.57
Total Investment Per Acre	$19.42	$11.89	$15.13	$14.88

fertilizer and other materials.

Sometimes the owner of the grove purchased the materials or a part of them himself, and sometimes he left it to the caretaker to purchase them for him. In some instances the materials were charged to the grove owner at retail prices, while in other cases the fertilizer and some other materials were charged at wholesale prices.

Some caretakers made a flat charge for supervision ranging from 50c to a dollar per acre per month, in addition to the charges made for each operation. The most unusual charge for supervision was around $7.50 per acre per year. Others made no direct supervision charge but relied on the difference between costs of labor, power, machinery, and materials, and the charges made, to take care of overhead, supervision and profit.

The most usual charge per day for labor hoeing, pruning, banking, spreading fertilizer and the like was $2.50, followed by $3.00, with an average of $2.75. The range of charges was from $2.20 to $3.50 for this type of labor. See Table 4.

For a driver and team, and including wagon, harrow or plow, the most usual rate charged was $7.50 per day, although the average was somewhat higher, with a range of from $7.00 to $10.00 per day. For the use of a spraying machine with 2 and 3 men and team, the charge per day averaged $19.00, with the most usual charge being $20.00. There were occasional teams so well trained that a driver was not necessary. Where tractors and trucks were used to pull the sprayer, the charge per day was somewhat higher.

The charge for disking and Acme harrowing with tractor ranged from $18.00 to $30.00 per day, with $20.00 and $25.00 being the charges most frequently made.

For dusting and spraying, where a truck was used to pull the machine, the charges were slightly higher than with team, but where the tractor was used the charged averaged nearly 50 percent higher than for team.

We have no data on the actual charges per acre made against the owners of these groves, but in another study where information was obtained for 477 grove properties, owned by non-residents of the state, which were cared for by more than 200 different caretakers, we found that their costs were divided about as follows: 40 percent for labor, supervision, power and use of equipment; 40 percent for fertilizer; 10 percent for other material; and 10 percent for taxes.

The actual combined charges for labor, supervision, power and use of equipment increased with the increase in the age of trees, but not as fast as did the charges for fertilizer.

Using the combined information obtained from the 477 out-of-state owners whose properties were widely scattered, and assuming that the records from the 33 caretakers were fairly representative of caretaker costs for the year and age trees included in this study, the difference between the charges to owners and the costs to caretakers for labor, supervision, power and use of equipment was about 10 to 12 percent.

Acres Per Item of Equipment, Labor and Power

Turning now to some quantitative data, it was found that on the average these 33 caretaker businesses had one work animal for every 84 acres of grove cared for, one power sprayer for every 355 acres, one tractor for every 376 acres, one truck for every 425 acres, and one power duster for every 646 acres. As the grove acreage operated per caretaker increased, there was a decided tendency for the acreage for each important item of equipment to increase. Taking the businesses operating less than 200 acres of grove and

(Continued on page 25)

TABLE 3.—Average Costs to Caretaker For Labor, Power and Equipment Per Acre of Grove, 33 Caretakers, 22,935 Acres of Grove, Lake and Polk Counties, 1929.

Item	Under 200 Acres	200-500 Acres	Over 500 Acres	Average For 33
Number of Records	10	12	11	33
Work Animals	$ .30	$ .15	$ .26	$ .24
Feed	3.51	2.44	2.01	2.16
Total Feed and Work Animals	3.81	2.59	2.27	2.40
Employees' Dwellings	.02	.04	.19	.16
Other Buildings	.36	.19	.37	.36
Total Real Estate	.38	.23	.56	.52
Wagons and Trailers	.19	.05	.03	.04
Tractors	.97	.52	.33	.39
Autos	.55	.25	.25	.33
Trucks	.52	.35	.20	.23
Sprayers	.54	.34	.37	.37
Dusters	.24	.17	.06	.09
Harrows	.20	.18	.11	.12
Mowers	.13	.05	.06	.06
Miscellaneous Equipment	.35	.17	.19	.20
Total Equipment	3.99	2.06	1.70	1.88
Gas and Oil	3.50	1.85	2.29	2.28
Labor	13.69	9.59	14.10	13.32
Supervision	10.11	5.97	5.82	6.08
Total Labor and Supervision	23.80	15.46	19.92	19.40
Misc. and Office Equipment	.06	.09	.21	.18
Total, Not Including Interest	36.04	22.28	26.95	26.66
Interest at 7%	1.36	.83	1.06	1.04
Total, Including Interest	$37.40	$23.11	$28.01	$27.70

TABLE 4.—Charges Made Per Item By Caretakers For Various Jobs, 33 Caretakers, Lake And Polk Counties, Florida, 1929.

Item	No. of Records	Range	Average	Most Usual
Disking Per Acre*	8	$ 1.25— 2.00	$ 1.69	$ 1.50 and 2.00
Per Day, Team	18	7.00—10.50	7.92	7.50
Per Day, Tractor	14	18.00—30.00	22.46	20.00 " 25.00
Acme Harrowing Per Acre*	6	.65— 2.00	1.10	1.00
Per Day, Team	20	7.00— 8.33	7.92	7.50 " 8.00
Per Day, Tractor	11	18.00—30.00	23.17	20.00 " 25.00
Mowing Per Day	7	8.50—10.50	9.71	10.00
Spraying:				
Per Day, Team	23	10.00—25.00	19.00	20.00
Per Day, Truck	2	20.00—27.00	23.50	
Per Day, Tractor	3	20.00—37.00	29.00	
Dusting:				
Per Day, Team	16	13.50—27.50	20.94	20.00
Per Day, Truck	3	13.50—27.00	21.33	
Per Day, Tractor	6	15.00—50.00	30.75	
Per Acre	5	1.00— 1.50	1.15	
Fertilising:				
Per Man, Per Day	18	2.25— 3.50	2.58	2.50
Per Team and Wagon	5	7.00— 8.50	7.50	7.50 " 8.50
Per Truck	2	8.00—15.00	11.50	
Per Ton	4	1.50— 4.00	2.50	
Hoeing:				
Per Day	23	2.25— 3.50	2.68	2.50
Per Tree	2	.02— .05		
Picking Drops Per Day	29	2.20— 3.50	2.74	2.50 " 3.00
Pruning:				
Per Day	25	2.25— 3.50	2.87	2.50 " 3.00
Per Tree	3	.05— .25		
Banking	23	2.20— 3.50	2.73	2.50 " 3.00
Tree Replacement	23	2.25— 3.50	2.76	2.50 " 3.00
Plowing Per Day:				
Single	22	4.50— 6.00	5.23	5.00
Double	3	7.50— 8.50	7.83	7.50

* Per acre charge is for each time operation is performed.

The Citrus Industry

with which is merged The Citrus Leaf
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ARSENIC SPRAY SITUATION

As The Citrus Industry goes to press, word comes from Tallahassee that the state senate has passed by a vote of 19 to 14 a bill exempting grapefruit from the operation of the anti-arsenic spray law. At the same time word comes that the senate has under consideration another bill which would repeal the anti-arsenic law as regards oranges and tangerines.

At the recent meeting of the Florida State Horticultural Society a resolution was adopted asking the legislature to exempt grapefruit and tangerines from the prohibition against the use of arsenical sprays. A bill to this effect was prepared and introduced into the legislature and had the support of the Florida Citrus Growers Clearing House Association, the Committee of Fifty, the Florida Citrus Exchange and many independent shippers, and was generally endorsed by the growers of Polk, Pinellas and Highlands counties, all large producers of grapefruit. The principal opposition came from Commissioner of Agriculture Mayo and from growers in Manatee, Lee and Lower East Coast counties.

Reports from Tallahassee at the time of going to press seem to indicate that the lower house may be expected to acquiesce in the action of the senate in exempting grapefruit at least from the operation of the anti-arsenic law. The lower house also is considering a bill to reduce the ratio of soluble solids in grapefruit from eight per cent to seven and one-half per cent. This provision is being urged to permit of the earlier shipment of grapefruit.

What the final outcome of the several measures before the legislature may be is problematical, but the vote on the first measure in the senate seems to indicate a favorable sentiment toward some modification of the anti-arsenic spraying law.

This law was first enacted at the urgent demand of growers, shippers and other citrus factors, in the belief that the use of arsenic sprays was detrimental to the palatability of the fruit treated, though harmless from the standpoint of health. Of late there has been a general change in sentiment in this regard, due to laboratory and field tests which indicate that the only effect of the use of arsenical sprays is to hasten the ripening and coloring of the fruit, with no deleterious effect upon the quality of the fruit itself. This view was strengthened by the general use of arsenic in the bait sprays during the campaign against the Mediterranean fruit fly.

The principal objection to the elimination of grapefruit from the operation of the law has been, not that the use arsenic affects the quality of the fruit, but that its use would provide a "talking point" for the producers of grapefruit in other states.

That there will be some change in the present spray laws and also in the "green fruit" law, seems to be fairly well assured. Whether these changes will be for the better or for the worse depends largely upon the activity of the growers themselves. The legislature is evidently disposed to act, once the growers have made known their attitude toward proposed legislation, and it therefore behooves the growers to promptly unite upon the legislation desired and to make known their desires to the law makers at Tallahassee. Any changes in the present laws should be in accordance with the views of the major sentiment of the growers and that sentiment should be expressed freely and promptly.

COMPULSORY CONTROL OF DISTRIBUTION

Having failed to control distribution of citrus fruits and other agricultural products through voluntary action of the growers and shippers themselves, the states of Florida and California are being asked to enact legislation for compulsory state control of distribution.

In California such legislation is already well on its way toward enactment, while a bill providing for similar state control has been introduced in the Florida legislature and has the support of the directors of the Florida Citrus Exchange and the members of the Grapefruit Control Committee, composed of one member of the Florida Citrus Exchange and four independent shippers.

State control, either of distribution or production, is an obnoxious theory to many agricultural producers, who are prone to pride themselves upon their independence of action. If it comes, it will be because the producers have failed to provide for their own safety through their own action.

It is less expensive to buy fertilizers and insecticides to produce quality fruit than to pay freight bills on poor fruit.

Citrus growers have made no money this season, but at least they have lost less proportionately than those engaged in other industries.

Whatever other steps may be taken to insure the prosperity of citrus growers, let it not be forgotten that the first essential is the production of quality fruit. Only the grower himself can govern this.

Top Working Citrus Trees

By LEO H. WILSON at Meeting State Horticultural Society

Graftage, which includes grafting, budding and inarching, is the natural or artificial process of making a part of one plant unite with and grow upon the roots of another. A graft may therefore, be considered as a cutting which unites some of its tissues with those of another plant.

The term "graffed" was used by Paul, the apostle to the Romans, in the 11th chapter and the 23rd and 24th verses in these words; "And they also, if they abide not still in unbelief, shall be graffed in: for God is able to graff them in again. For if thou wert cut out of the olive tree which is wild by nature and wert graffed contrary to nature into a good olive tree; how much more shall these, which be the natural branches, be graffed into their own olive tree."

Going still farther back, we find as a Horticultural process, graftage is of very ancient origin. In his Natural History (Vol. 2 pp. 477 to 485), Pliny about 2000 years ago wrote about it as common practice but its methods have been kept largely as trade secrets or mysteries until within the last half century or so. Pliny says the art was taught by nature but goes too far, for he declares that cherry has been found growing on willow, sycamore on laurel, laurel on cherry and so on.

For centuries the Japanese have practised top working fruit trees. The art greatly improved the quality of the new variety and the system is often referred to as the Japanese Sandwich. For example, a temple top work on common Grapefruit, originally budded to Rough Lemon root, gives an unusually fine quality of Temple Orange. In this case, Common Grapefruit is the Sandwich, located between the lemon root stock and the Temple fruit branches.

The principal methods of grafting citrus are by approach, scions and buds. A. In approach grafting, several parts from different stocks are united by bringing the roots, branches or stems together. B. Scion grafting includes methods as the cleft, side, splice, tongue, saddle, crown and whip. In all these forms, it is necessary to bring the growing parts into apposition. C. Bud grafting is moving the buds of one plant along with a small section of the bark to another plant in which a wound has been made.

The top working of citrus trees is a process of changing the fruiting branches of a tree to that of another variety and any of the above methods may be used to accomplish this.

There are several reasons that make it possible or necessary to change the fruiting branches of citrus trees. In case of cold injury we often find it necessary to saw the tree off at the ground, insert grafts or bud sprouts that soon develop, or if the injury is not too severe, cut back the limbs near the main body and graft a new top provided the variety at the time is unpopular—like Tangerines and common Grapefruit are at this time. Unproductive trees and trees producing fruit of poor market value can readily be changed, for with a large healthy root system, it only takes about 3 years to have a successful top-worked citrus tree in satisfactory production.

Sometimes the root stock and bud are not congenial. Take the Temple bud and lemon root. They are not good companions. But top working a budded tree on lemon root with temple—here the sandwich system greatly improves the quality of the Temple fruit. On light sandy soil, this system produces a Temple Orange equal in quality to the Temple on sour Orange root.

There is a decided improvement in the quality of the fruit by changing the root system of citrus. The approach graft or inarching with adaptable root stocks, greatly influences the quality of the fruit.

Top working citrus is often desirable to give a variety of fruit for home use or local markets. The system produces fruit of excellent quality in a very short time. Some fruit may be produced the first year.

In top working a citrus tree, we should be very careful to select the right method. I prefer lopping the limbs of bearing trees for several reasons—1. Small branches often can be left just below the lopped limb that can be budded. 2. A side or bark graft may be inserted immediately after lopping. 3. Sprouts soon develop that will take buds in a few months. 4. If lopped in December or January the lopped limbs will bloom heavily and produce a very satisfactory crop of fruit, while the top is being changed. 5. Lopping the limbs prevents too great a shock to the root system and allows the continued flow of sap necessary to maintain health and vigor to the entire set-up. 6. After the new top is started, the lopped limbs are gradually removed until the new top is able to support the root system. Too rapid removal of the top on old trees 10 to 20 years and older often produces a die-back or frenchy condition, hard to overcome.

Cutting off all the limbs—there is a risk of sun burning. Leaving part of the branches the first year for shade and fruit production is quite a safe system. The following year the balance of the tree can be cut back and grafted. Whatever system is used, let it be started in mid-winter. There is less danger from sun burning and buds will have better opportunity for growth before aphis appear in harmful numbers.

Whatever system used, the operation will be found rather expensive. It is necessary when budding in the limbs to use enough buds to insure a rapid top growth, yet there must be a limit. Working high in the limbs, a ladder or a platform is necessary. This method calls for many buds, continuous sprouting and wind injury. A modified system is best. Try and work no higher than one can conveniently work from the ground. The operation is more economical.

A very safe and rapid system for trees up to 6 and 8 years old is lopping at or near the ground and inserting one or more grafts. If the the scion fails, sprouts soon develop for budding. The lopped tree will produce fruit while the new tree is forming. This is very satisfactory for seedlings too large for budding.

In lopping limbs, one must exercise the greatest of care to prevent splitting down of the bark. The use of a tourniquet placed under the sawed surface will prevent bad splitting of the wood. A short piece of sash cord will answer the purpose. This cord is stout, yet will not injure the bark.

Side grafts may be inserted just above or just below the bud union, depending upon the variety used and the root stock. After the scion shows signs of growth, the top may be partly cut back or the tree girdled above the graft. This will allow more sap to the scion and hasten growth, an operation often necessary to start scion growth. Later on the tree may

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IMPRESSIONS

By Frank Kay Anderson

A bag of two hundred fifty skunks in twelve months. That's almost a skunk a day for each working day in the year. Pretty good for folks not in the fur business. Not to forget over a hundred possums and sundry other things during the same period. That's a partial record of the destruction on the Whitney properties at Zellwood of the enemies of quail and other game, which it is the endeavor to preserve. Including the peat property, Richard Whitney has approximately four thousands acres there. First effort to stock with game began with wild turkeys in the bayhead and hammock land; then quail on the uplands. It can now be termed a success; but the wild enemies preying on the game made it an uphill job for a while. In fact it was not until the destruction of these natural enemies of the game took persistent and systematic form that the game began to have a really fair chance. Incidentally a large number of rats and snakes also have bitten the dust in the course of this warfare; or rather the dust has bitten them. For one of the very effective methods developed is to put a couple of tablespoonsful of cyanide dust down each gopher hole, and then to seal the top of the hole with dirt. That is very depopulating, so to speak.

Which hasn't the slightest relation to, yet somehow reminds us to ask, what happens to an orange when the gas it customarily exhales is sealed up within it? That is what actually occurs when paraffin or other preservative is used to coat the exterior of an orange before it goes to market. Well, we are not prepared to give the answer; but there is an effect upon the flavor of the orange for one thing. The answer for some time has been sought at the Federal experiment station at Orlando; and some day it will be handed down to us. Some weeks ago we dropped in there for a chat with J. R. Winston, and bumped into this particular experiment. In a heavily insulated room permitting of close temperature and atmospheric control we were permitted to see a certain number of oranges obligingly breathing inside glass jars so that the exhalations were caught and carried through rubber tubes to various registering instruments. It was all very intricate and bewildering; but we were able to get this much straight; that ultimately these busybodies of Uncle Sam's are going to be able to tell us just what happens inside an orange after it has been given a preservative coating, and why.

A meeting with Frank Beaty of Cocoa in the flesh, and mighty pleasant to see him so. Looking well now; fully back to normal, and only a few more gray hairs to show for the experience in that automobile wreck which will have kept him out of his job of running the Cocoa and Mims packing houses of the AFG organization for a year. Many, many weeks on the verge, playing tag with the shadows. Tough to lose a year out of one's business life, but Frank Beaty's mental attitude is refreshing. So glad to be continuing on this earthly sphere that nothing else counts. Attaboy, Frank!

We did not get down to Lake Wales for the meeting of the Horticultural Society, which was our hard luck. Aside from missing the opportunity of telling a few of the participants some things, according to our habit, we really did want to listen a bit. We particularly wanted to hear J. E. (Jim) Turlington's paper covering the sixteen year record on the income and outgo of those groves, and also a number of other items on the program, including B. L. (Burks) Hamner's baritone solo on Wednesday evening. Also we wanted to meet that new man, Mr. "Chester T. McIvin" of Tampa. (Thank goodness, ours is not the only linotype which stutters at times).

However, we had other fish to fry and missed the meeting. Through the death of one of our friends we had a sudden vacancy in the legislative representation in our county, and a special election was called for April 12, the big day of the Lake Wales meeting. A flock or covey of candidates came forward. Then on Saturday afternoon preceding the election on Wednesday we, ourself, became inspired to save the country. We threw our hat, shoes and necktie into the ring, and waving a C-I subscription blank as our banner made our bid for votes. Had a fairly narrow escape at that. Something less than a hundred votes short of being high man when the count was made. We seem to have the knack of being runner up in such episodes. We can get up enough speed to run second invariably, but not enough speed to break the tape with our own manly bosom. Thus perishes, again, our pet project for saving the country through currency reform. We did, oh, so badly, want to have this legislature make gophers legal tender. It's a long, dry summer coming.

William Weaver of Fowl River, Alabama, well known pecan and satsuma grower of the Gulf Coast country, recently paid a visit to the citrus sections of Florida, looking things over and picking up new ideas. We have not the honor of a personal acquaintance with Mr. Weaver, but we know he is a progressive grower for he confided to several persons that he is a regular subscriber to THE CITRUS INDUSTRY. Further, at the Florida Insecticide Co. at Apopka, and at the Florida Humus Company at Zellwood, he told them that he had been reading their advertisements in said publication. That is our idea of something like what a regular subscriber ought to be. As they say in the country press, Come again, Mr. Weaver!

The most comfortable man to talk to in citrus circles, according to our notion, is E. D. (Ed or Dee, take your choice) Dow, traffic manager of the Florida Citrus Exchange. Ran into him recently when in company with J. Curtis Robinson he was aiding to prepare certain exhibits for the industry to lay before the Interstate Commerce Commission, relating to conditions as a whole. As per usual, he was plugging steadfastly along, after the manner of one who knows whither he is traveling and is on his way. Non-political, too, this Dow person. That is to be expected of one, and the only one, who has stayed in

the employ of the Exchange since the first day it opened for business. From time to time battles have raged all round him; but he has contrived to stay out of them, and to keep his attention upon the job of handling the cooperative's traffic affairs. A good job he has done, too, if you ask us.

During early April a visit with the well known Frank Haithcox, a Floridian who has been spending the past few months in an important North Carolina center. Not a citrus man himself he was interested in noting upon the markets there a very large quantity, so he said, of oranges and grapefruit which had been pulled, rather than cut, from the tree. He asked us if there had not been heavy stealing of fruit here this winter. We told him we had heard of a good bit of trouble from fruit thieves. A certain shamefacedness prevented us from mentioning the possibilities of dropped fruit and culls.

Glad to learn from Harry Papworth and Ben F. Haines, the well known Seminole County growers, they share our view that the proposed cross-state ship canal would be very hurtful to our Florida industry, particularly to grapefruit, in that it would open the way for water rates on the Texas product to the eastern seaboard. Now if they will only go out and talk that broadcast, for that's what we regard as a plumb good pair of talkers.

Rube Garden says going off the gold standard isn't so painful; that he'd been off quite a while before he knew it.

Dusting seems to be going into the discard, and spraying would seem to be coming back into its own. That is a casual statement, based upon personal observaion. In a number of groves we have observed recently, where at this time we were expecting to see the dust flying, we have noticed the spray rigs busy instead.

A lot of bother and argument in recent weeks upon the subject of the forbidden sprays to induce early maturity of fruit. Mostly the same old arguments pro and con, but F. W. (Frank) Wheeler, the well known Oviedo shipper introduced a new one. It is his idea that the use of such sprays should continue forbidden because their use will, in his opinion, still further add to the overabundance of small-size grapefruit which in the early part of every shipping season creates a terrific marketing

(Concluded on next page)

IMPRESSIONS

(Continued from preceding page)

problem.

Those well meaning folks who for a time stampeded the meeting of the Horticultural Society, and came very close to obtaining an organized effort to induce this season of the Legislature to abolish our present bulge pack by law, were singularly uninformed. The movement was based upon the assumption that California does not use a bulge pack. A very great many growers who have visited the northern markets, and most any shipping man, could have corrected that false notion, had they been questioned in advance of launching that movement. For our own part we are not in love with the bulge pack; but so long as it is in use by any other citrus producing areas it is our notion that the use of it in Florida is practically compulsory. Therefore, until such time as there is possibility of concerted action from all producing sections looking toward its abolishment, the less said in disparagement of our Florida bulge pack the better.

C. N. (Pinky) Williams, citrus salesmanager of the American Fruit Growers Inc., blamed the collapse of our citrus markets during April upon that thing now referred to as three-point-two, formerly known to residents of these United States as beer. In other words purchases of the newly legalized beverage, in good part stimulated by the fact it was a novelty, went a good way toward absorbing the buying power of the public, other than for absolute necessities, during that time. A temporary effect, and one due to wear off fairly quickly.

For our part we wonder what was the effect upon the market for synthetic gin during that same period. We have a notion that many, many of our growers would truly be surprised if they could approximate the amount of oranges consumed in the form of juice as an ingredient of cocktails in some of the larger cities, particularly in New York. It's our own somewhat haphazard impression that there are somewhat more cocktail shakers than skillets in New York City.

The Rio Grande Valley Citrus Exchange has closed its first year. During that period it handled slightly less than half the commercial shipments of citrus from the Valley. Of a total of approximately four thousand carloads shipped from the Valley practically one-third moved by truck. More than ninety per cent of the shipments were of Marsh Seedless grapefruit. The pink-meat Marsh and the pink-meat Foster were in greatest demand in the markets, and brought by far the highest prices.

The Texas Citrus Growers Exchange, the old marketing organization, did not fare so well in the matter of tonnage this past season. Which organization of the two cooperatives is due to survive we cannot at this distance guess, but we doubt if there is room in the Valley for two cooperatives, and the existing independents even though there is an outlook for from twelve to thirteen thousand carloads to be shipped next season.

Like Florida, this Texas area had to market a crop of fruit of poor quality. The cold of March 1932 plus prolonged dry weather operated to produce a crop in which first grade fruit was sadly lacking. Despite this fact the Texans apparently fared pretty well in their marketing. It is difficult to reconcile such figures as we have been able to gather from growers using both cooperative and independent marketing services, but it is our guess that for the graded fruit shipped out of the Valley the growers obtained a net of between sixty and seventy-five cents per box on the tree for the whole crop.

That's our guess as to the average. Of course, some growers with quality fruit averaged quite a bit higher. Even in the worst marketing seasons there is a willingness to pay a premium for good fruit.

Down in Palm Beach county a concern launched about two years ago has now more than 140 acres in asparagus. They marketed a good crop this past winter and at satisfactory prices. We wish them well. For many years we nurtured the notion that asparagus ought to be, could be, grown in Florida. Asparagus is one of our favorite fruits. Finally, after a lot of getting ready, we prepared to show how it should be done. Our ideas were excellent; but they didn't work. So flatly did the understanding fizzle that even up to now when Friend Wife wishes to deflate us she does it with one word. Asparagus! No more for us in the sandhills, but down in the muck with both drainage and irrigation these regular, not volunteer, asparagus growers may make a real success of it, and give us an additional winter crop. We hope so.

From Winter Haven Jay Stull writes, "I consider the laundry geysers one of Nature's most remarkable freaks, and cannot but wonder why they have never been written up." Well, here goes.

Located in the heart of the Black Forest of Germany, they are locally called "Die Waschengeiser." The three springs are located in a row, about six feet apart. The water of the first one is quite warm and contains a natural soapy substance. From all about the native women gather here to do their washing. The week's wash is thrown into the first geyser where it is whirled around for some time by the moving water. Then the geyser spouts throwing the wash into the air. A stiff wind which here blows continuously from the South carries the wash to the middle geyser, which is also warm but its water is clear. Here the clothes are thoroughly rinsed by the whirlpool motion.

After precisely twelve minutes of this rinsing process the middle geyser spouts the clothes into the air and they are carried over and deposited in the third pool which contains a natural bluing element. From this last pool, which does not spout, but has a slow whirling motion, the natives remove the clothing with wooden forks and hang it upon lines to dry. It is as thorough as any laundry, and no buttons ever are lost. Of course, the steady wind is a big aid, but the truly marvelous thing is the manner in which Geyser No. 1 and Geyser No. 2 have been synchronized by Nature, the one being quiet while the other spouts and vice versa.

We forget whether it was A. R. (Pat) Bogue of Tampa or C. G. Bouis of Fort Meade who first told us of "Die Waschengeiser," but anyhow Arnold Bauer of Winter Park visited the spot and saw them in operation when he made his trip to Germany five years ago.

THE GROWERS' OWN PAGE

This department is devoted to the growers, for their use in giving expression to their views and a discussion of growers' problems. Any grower is welcome to make use of this department for the discussion of topics of interest. The only requirements are that the articles must be on some subject of general interest, must be reasonably short and must be free from personalities. The editor assumes no responsibility for views expressed, nor does publication imply endorsement of the conclusions presented.

OPPOSES CONSIGNMENT SALES

There has been a growing resentment among Citrus Growers for the past few years against the evils of consigning citrus fruits, and uncontrolled Auction Market practises. Practically all growers say these detrimental practises must cease if the industry is to survive.

The best minds in the Citrus Industry pretty well agree as to just what is wrong with the whole structure and it can be summed up in a very few words. Every thinking grower wants ACTION and wants it NOW and is going to have it.

No other business is conducted so loosely, and thoughtlessly as Agriculture in all its branches, and nobody but the farmers and growers themselves are responsible for their failures to reap the fair profits to which they are entitled. They MUST attend to their own business and stop whining, and passing the buck, but place the blame exactly where it belongs. Then do something about it.

The CONSIGNING of citrus fruits has always been most unsatisfactory, and will continue to be so, AND THIS ALONE IS THE ROOT OF THE ENTIRE TROUBLE. How can you expect to simply hand over your crop, good or poor, to a marketing agency, be it the Florida Citrus Exchange, or an Independent Packer and really expect a highly competitive organization to look after your best interests? Tying up crops thru liens, for the sole purpose of consigning such crops must go if we ever expect to prosper, and the sooner the better.

Consignment of fruit has been the greatest curse of the entire agricultural system of marketing, yet we have blindly stood for such practises for years, trusting to fate. Those you have placed your implicit faith in have failed you, and have become wealthy at your expense, and now you must seek other ways and means of marketing your crops if you expect to stay in business.

There is absolutely no inducement for a packer that handles your crop on consignment to return you a livable price for your fruit when nearly every packer in the state has "FREE" fruit to handle and fighting for business among themselves. The growers interests are forgotten in the mad, confused, scramble for business by 150 or more selling agencies throughout the entire citrus belt.

What are you going to do about it? There is much that can be done about it and it is going to be done and done in a hurry. Consigned fruit will be a thing of the past in a very few seasons if growers will organize in each county and find ways and means to bring this about. And such ways and means are not difficult. Public sentiment, and good business will see that our aims are attained regardless of opposition by certain interests.

Cast off the yoke of citrus oppression from your necks once and for all and conduct your affairs like business men and your financial troubles will vanish.

There are many in the citrus business that seem to think that the citrus grower is doomed; this is far from true—there is plenty of fight left in us yet.

For an example, a citrus packer unthinkingly unfolded to me the following story: "I wish the good old days would come back. Several years ago we purchased a beautiful crop of ten thousand boxes of oranges for which we paid $2.50 per box on the tree to the grower. We made a net profit of $2.80 per box on the lot —a total net profit of $28,000." Whether or not this was an equitable settlement to this grower or whether it is as it should be I leave to your own judgment.

There are many growers perfectly satisfied if they obtain their price and it makes no difference to them what the packer makes. But the point is that this grower did not lose any money, BECAUSE HE SOLD ON THE TREE, and the packer exerted an effort to SELL this fruit and made a handsome profit. It probably would have been an entirely different story had this grower consigned the crop.

As I have said before, the consigning of fruit is the biggest blunder that we can make. Now, the SECOND greatest trouble is the tremendous amount of poor second and third grade fruit raised in Florida.

I will grant you that the worst, disreputable-looking specimen of either grapefruit, tangerne, or orange may be delicious in flavor and full of juice BUT—this is apparently not what the trade wants and must not be forced upon them. Beautifully colored fruit of smooth texture, in combination with a delightful flavor is the citrus in demand. The time has come when packers are expecting and demanding fruit of high grade and the trade is very discriminating. The grower that ignores and disregards this trend of thought is going to find his crop left on his hands or compelled to sell at a loss.

Let me say here that there is not a grove in the state of Florida that cannot be made to produce a profit if properly managed, in a given time. Any number of intelligent growers throughout the State can take over groves which do not show a profit and produce results thru the application of sound grove practises.

High grade fruit and healthy trees can only be produced by applying adequate amounts of the very best fertilizers, proper cultivation, the use of insecticides and judicious irrgating. However, irrgation is not absolutely necessary if trees are given ample amounts of plant food which is stored in the trees and trees in good condition will withstand drought very well.

During the past several years there has been much justifiable complaint among the packing agencies regarding the large amount of small, poor-grade fruit. False economy in fertilizing, the use of cheap grades of fertilizers, and lack of cultivation have played an important part in producing fruit of poor qualty. Growers that have been liberal in expense have not suffered to any great extent, and have reaped the financial harvests that belonged to them. All others have suffered.

I could name a dozen growers in this vicinity that year after year, sell their crops for a good price, regardless of how bad general market conditions are during the season. Packers have learned to depend upon such growers for the grade of fruit and the quantity they want, and these growers are the very first to obtain good offers and MAKE MONEY regardless of conditions. Frequently

packers will offer twice as much for a crop of fruit of the same variety, as one just over the fence. Yet the indifferent grower fails or refuses to admit the reason. He cannot expect nor is he entitled to the same price as his neighbor if his fruit is inferior.

The Florida Citrus Grower is directly responsible for the unprofitable California Citrus Industry, and also our own condition, due primarily to lack of foresight and initiative, and the attitude of "letting John do it". If California growers fail it will have a worse effect upon us than you realize. There is no need for the industry to suffer in either State if growers become aroused and do something to remedy the situation.

During the past few years the Bankers of Florida have done the State as a whole a grave injustice in refusing to recognize the importance and stability of the Citrus industry, which they admit is the very backbone of the State. By refusing to loan money to responsible growers on the pretext that it was too risky and that they did not wish to go into the grove business, forced growers to borrow elsewhere, to the detriment of thousands of growers. Yet these same bankers gladly loaned money to the citrus packing giants who kindly loaned to us and offered to CONSIGN our crops. Had bankers loaned to growers individually for a specific purpose only, instead of these agencies directly responsible for our present plight, there would have been $40,000,000 to $60,000,000 more citrus receipts coming back into the State each season.

History has proven beyond a shadow of a doubt that what they did accept for collateral was not quite so substantial! The citrus industry goes right on. Individual grove loans with proper restrictions by Florida Bankers would be the salvation and the solution of our citrus problems.

The individual or institution that will come in and back up the growers with cash to relieve them of burdensome ties will have the heartfelt thanks of the entire State. Such a group of investors must first satisfy the industry that it will not be exploited. In turn the growers must unquestionably assure their benefactors of honest co-operation. Should the banks open up credits to the citrus growers which would enable them to free themselves of their alliances and permit them to hold their fruit on the tree until a suitable price was obtained, within three years every debt would be repaid and more money flow thru the channels of trade than can be imagined.

The Florida Citrus Exchange has been a disappointment and its failure is due principally to the indifference of the membership as to how it has been managed; the Florida Citrus Growers Clearing House Association was cleverly taken over by the shippers of the State, thru a serious blunder of the Committee of Fifty, even after being warned by Merton Corey, and the growers are at the mercy of the various shipping agencies shooting thousands of cars of UNSOLD, CONSIGNED fruit to the detriment of the entire industry.

What will be the outcome? Will the 13,000 growers permit a handful of packers to run their business or will the growers organize in each county and formulate plans to conduct their own affairs on a sound business basis via the route of—sell on the tree basis, and by the raising of better grade Citrus?

Orderly marketing will only come when buyers of citrus fruits are forced to go out and buy at a fixed price based upon quantity and quality and this the grower must see is done if he expects to prosper. Everything else has been tried out, but we do know that in times past when there was little or no consignments, that we did make money and it can be done again.

What about the Florida Citrus Exchange in this set-up? They too must be compelled to sell at a satisfactory price or quit. There should be no more competing of Exchange fruit against the Independents, and underselling as has been reported on numerous occasions. The Exchange has no more business consigning fruit than an independent agency, and it is claimed that the 35% of the State crop that is handled thru the Florida Citrus Exchange of which a large percentage is handled on the auction or consignment is the cause of the independents striving to get control of consigned fruit as they could not compete against exchange methods. There are outstanding examples of splendid Exchange management in several counties and these Associations have made money for their growers but as a whole it has been anything but satisfactory. The determined, courageous stand taken by President Edwards in behalf of the Exchange members may have a decided effect in bringing about orderly marketing.

The American consumer is no piker. He is perfectly willing to pay a fair price for what he wants and enjoys good citrus. In normal times the trade is willing to stand .35 to .60 cents or more per dozen for good oranges, and this will net the grower from $1.50 to $2.50 on the tree for his fruit. Taking all the hazards such as freeze, storm, short crops, etc. and insect ravages into consideration, the grower must get something like the above figures to make the thing worth while.

At present and for some time past the great chain stores through the nation have been hammering down prices on all agricultural products and this is seriously hampering the shippers of citrus fruits. This practise must be stopped and can only be done from this end of the line by setting the price.

We have been clamoring for cheaper transportation rates and have been urged to use the boat lines. This we have done this season at a lower cost of from 35 to 50 cents a box under rail shipments and still we receive less money per box than ever before. It is plain to be seen that the only solution for the grower is to take matters into his own hands, and SELL his fruit—not give it to someone to gamble with.

It is claimed that the depression had much to do with the prices of citrus this season and last. I will agree to this, yet how do you account for citrus bringing $1.00 to $1.75 per box on the tree from the first of the season up to January 10th? We were just as "sick" financially during that period as we have been up to March 4th. Supply and demand is the answer. The glutting of the markets thru excess boat shipments was ruinous and shattered the faith of the trade.

Most of us realize that the average packer is a good fellow and a pretty keen business man and there are many among this group who would like to see the fruit business on a sound basis. This class of packer cannot do the impossible when 65 percent possible of all fruit shipped from Florida is on consignment. It is unreasonable to expect him to help you if you don't do something for yourselves.

The time has come when you MUST act and I suggest that an organization of all citrus growers, both independent and exchange, in each County be formed to discuss methods with which to deal with the problems that are constantly arising from year to year. Get your bankers and business men to see the true state of affairs and they in connection with public sentiment, will help you attain your objective.

Recent Government surveys show that Florida alone has approximately 363,000 acres planted to Citrus, divided as follows: 268,000 acres of oranges, including Tangerines and

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Are You Robbing Your Soil ?

Sounds like a foolish question, doesn't it? No man would knowingly take from his soil the very elements that enable trees and plants to thrive and produce crops. Yet many growers are unintentionally sapping the vitality from their land through the use of cheap, unbalanced fertilizers—materials that fail to put back into the soil the plant foods taken out by growing crops. Such fertilizers are usually water soluble and quick acting. Results from their use may appear satisfactory for a number of months. In fact, the danger is not always apparent until after the damage is done. But sooner or later the soil becomes sterile and unproductive—burned out.

Play safe with Gulf Brands

Insist on Gulf Brands of Fertilizer for both grove and truck farm. Gulf Brands are properly blended and balanced. Rich in long-lasting, natural organics they assure safe, uniform crop nutrition. They are never cheapened through the substitution of low-priced, water-soluble synthetics. You can depend on Gulf Brands—always.

Gulf BRANDS OF Fertilizer

The Gulf Fertilizer Company, Tampa, Florida

Field Men at Tampa, Clearwater, Bradenton, Winter Haven, Orlando, Leesburg, Bartow, Wauchula, Lake Wales, Cocoa and West Palm Beach

THE GROWERS OWN PAGE

(Continued from page 16)

Satsumas. Of this acreage 85% is of bearing age and over five years old; 95,000 acres of Grapefruit of whch 90% is of bearing age over five years old making a grand total of 363,000 acres. Taking the 219,000 acres of oranges of bearing age and giving this a fair but low value of $1,000 per acre we have $219,000,000, and the 85,000 acres of bearing grapefruit at $700.00 per acre we have $59,500,000 and the remaining 25,000 acres of non-bearing citrus at a conservative figure of $300.00 per acre we have $7,500,000. This gives us a conservative value of $286,000,000 invested in citrus groves alone.

$70,990,000 a year is derived from this gigantic industry during the 1932-33 season as follows:

$24,865,000 for grove expense based upon $75.00 per acre in bringing the crop to maturity, and approximately $35.00 per acre on non-bearing groves.

$30,375,000 revenue is derived from our estimated 22,500,000 box crop for picking, packing, hauling, and marketing expenses.

$15,750,000 revenue is derived from railroad and water transportation based upon an appropriate cost of .70 cents per box.

Taxes alone on this vast acreage must bring close to four to five million dollars. This, of course, has not been included in the cost per acre item.

Now let us see how we have fared with our 1932-33 crop.

We doubt very seriously if the grower gets an average of more than .60 cents net per box above packing expenses on all grades and varieties marketed this season, which leaves him .15 cents per box in the red on the cost of production, say nothing about interest on the investment. Possibly 10% of the growers raising high grade fruit and which know the "ropes" were successful in making a good profit. On the other hand the 150-odd packing house owners, with a possible investment of $15,000,000 in packing plants, equipment, etc., made not less than 10 to 20 cents per box profit on 22,500,000 boxes. About 10% on their investment. There are exceptions of course.

In view of such conditions is it any wonder that all growers are fighting mad. They are the means of putting over $100,000,000 into circulation, but to get their just share, they know not how.

When growers finally learn that they MUST receive at least $1.25 to $1.50 per box average net on tree for their fruit each and every season which is imperative, to take care of off years occasioned by frost, freezes, droughts, short-crop years, storms, hail, and serious insect invasions, THEN and only then will they be on the road to prosperity. The shippng interests and many growers will argue that .50 cents for grapefruit and $1.00 per box for oranges each year is sufficient to show equitable returns on the investment. This is not true, but in isolated cases only.

Red-blooded, courageous, thinking growers are not going to sit down and "take it on the chin" any longer. These are the men that are going to organize private grower leagues and battle their problems out among themselves, and have a show-down with the packing interests once and for all. And the packers are going to act sensibly and work wth us or else suffer thru their refusal to co-operate and lack of foresight.

When packers and growers learn and appreciate the meaning of sound, fair, honest business principles and stop trying to "gyp" one another and work towards a stable, steady market price for fruit year in and year out, the trade, the grower, the packer—everybody will feel better and get a SQUARE DEAL. There is absolutely no sane reason why fruit should sell, for $5.00 one day and the next go as low as $3.00, upsetting everybody's calculations and resulting in a loss to the merchant buying fruit the day previous.

The time has arrived, we feel, when the shipper must get out and hustle to make a sale and open up new territory if he expects to be considered a marketing agency. The packer that ignores this will find himself without grower support, and in the future it will be the marketing agent that produces results for the grower that will survive.

Please don't throw this away, but read it carefully and add more helpful constructive ideas and put the industry where it belongs.

By Donald J. Nicholson, Orlando, Florida.

Endorsed by: Fred W. Reama, John Hand, E. G. Duckworth, Chas. O. Willitt, C. C. Daley.

TOP WORKING CITRUS TREES

(Continued from page 11)

be lopped and the top gradually removed.

There is a decided advantage in side grafting. The top is never touched until the graft shows definite signs of growth. If the scion should die, the tree is still intact.

"Approach" grafting may be considered a new deal in top working citrus. The system is practically the same as used in inarching with the exception that the graft after adhering firmly to the tree, is allowed to grow. The top of the tree is slowly removed. The system is good for the graft is placed on two root systems, affording rapid growth and quick fruiting. Hybrids or seedlings of new varieties will soon produce fruit when this system is used. Still another idea for approach grafting; plant a bud on a desirable root, at the base of an unprofitable tree and apple the approach graft. Remove the top of the unprofitable tree and the graft will be growing on its own root and the root of the unprofitable tree. The result will be rapid growth and production of fruit of extra fine quality. Temple on sour or Cleopatra root, grafted in this manner to Tangerine growing on lemon root, would be a fine example.

Inarching sprouts that form at the base of trees with defective bodies is a worth while practice. Inarching budded trees on uncongenial root stocks, using sour orange, Cleopatra, Mandarin or sweet orange seedlings, has a decided influence on improving the quality of fruit. Inarching Temple, Parson Brown and Pineapple budded on rough lemon root, with one of the above named seedlings, is an example.

Sawing large trees off at the ground or 18 or 24 inches above the ground and placing grafts or budding sprouts, I consider a very poor system of working over healthy trees. Cavities are sure to form, later decaying to such extent that the tree is broken up by winds or split off by the weight of heavy fruit crops.

Some Factors Influencing Decay In Florida Citrus Fruits

By J. R. WINSTON, Bureau of Plant Industry, United States Department of Agriculture, Orlando, Fla., at State Horticultural Meeting

Some growers are inclined to blame the shipper for all of the decay, while some shippers claim the grower is largely responsible for these losses. As will be pointed out further on, both the grower and the shipper share this responsibility, although not always equally. In some instances, through faulty grove practices, the fruit is almost ready to decay before the pickers enter the grove, in others the soundest fruit is ruined at some stage in the packing through abusive operations. The factors concerned are numerous and often interrelated or involved. Only the most obvious ones—those that have shown up repeatedly in our experimental work—will be discussed in this paper.

During the past few years the United States Department of Agriculture has been conducting fruit handling experiments in Florida for the purpose of developing better and safer methods of packing, shipping and storing citrus fruits produced under conditions of relatively high humidity where decay organisms thrive. This work has afforded an excellent opportunity to get first hand evidence on the factors influencing decay and it may truthfully be said that some of the ingrained ideas handed down from year to year have been found to be barely short of mythology.

While Florida fruit doubtless is inherently no more susceptible to decay than that grown elsewhere, it is subjected to infection by four major decay organisms, only two of which occur in quantity in other sections of the United States and these two—blue and green mold fungi—are not difficult to suppress. The other two—the stem end rots—are especially stubborn and are becoming more prevalent as the average age of our groves increase.

The principal factors concerned in our decay problem appear to fall into two categories, with respect to inception: (1) Pre Harvest factors, those which are operative while the fruit is on the tree, and (2) Post Harvest factors, those which originate in or are aggravated by faulty handling practices.

Pre-Harvest Factors

It is the pre-harvest conditions that the grower is in position to correct.

I. Without doubt dead wood in citrus trees is the greatest single factor in the production of stem end decay. It is the only known source of infection of the fungi which cause both types of stem end rot. Fruit from very young trees is not especially liable to stem end rot, but as the tree ages, its fruit becomes progressively more subject to this decay. This is doubtless due to the relatively greater amount of dead wood in older trees, which in turn seems to be associated with declining vigor of the tree. Scale insects, melanose and nutritional problems doubtless contribute to the accumulation of dead wood in the trees. Those practices that tend to check melanose also reduce stem end rot, and, other things being equal, trees that are kept free of dead wood produce fruit of better carrying quality than do trees in need of pruning.

II. Maturity of fruit at the time of harvest is also an important factor in decay, particularly stem end rot. Contrary to popular belief, fruit of early varieties harvested in early fall, decays much more slowly than fruit from the same trees harvested considerably later and also very much more slowly than that left on the trees until dead ripe. The same facts also apply to the later ripening varieties.

III. Fruit sprayed with the less volatile types of oil within a month or two of picking usually is difficult to color. Such fruit may have to be a day or more longer in the coloring room than otherwise is necessary. That extra day in the coloring room increases decay.

IV. The carrying quality of many midseason crops, including seedling oranges, has been greatly impaired by relying too much on ammoniates to produce the crop. Some of these crops color normally on the tree, but others do not. In either case there is but little strength in the rind, the fruit bruises easily and it usually decays rapidly.

V. Ample evidence has been gathered during the past few years to strongly suggest that the fertilizer schedules which are well enough suited for early and midseason varieties are usually not so well adapted to the late varieties. This is due to the fact that the maturing crop of late season varieties is on the tree at the time of reduced vegetative growth. The green pigments in the rind take on new life more or less in proportion to the amount of new growth. A regreened fruit is exceedingly difficult to color, often requiring double the average coloring period, thereby increasing the liability of the development of stem end rots.

VI. The grower often aggravates his decay problem when he follows cultural practices that tend to produce a coarse thick skinned fruit. Such fruit rarely develops enough color on the tree, necessitating coloring under conditions favorable to the development of decay. The green pigments in this class of fruit resist the action of the coloring gas, necessitating prolonged exposure to coloring room conditions. In extreme cases the fruit may still be green after three or four days in the coloring room.

Influences such as these have been increasing at an alarming rate during the past few years. To certain extent, mild winters may have played a part in this problem, but our records indicate the excessive—please note the word excessive—use of complete fertilizers, of ammoniates, of irrigation, usually in conjunction with a liberal supply of quickly available fertilizer, and of heavy leguminous cover crops annually over a period of years may be important contributing factors in the production of coarse fruit that requires prolonged treatment in the coloring room. Other grove practices that tend to unduly stimulate growth also tend to produce a coarse, greenish fruit. The fruit on lemon rooted trees tends to show the effect of these malpractices more quickly than that produced on other common root stocks. Some of this season's crops of the Valencia orange and Marsh grapefruit in certain localized areas are so green and coarse that they will have to be given, at least, twice the normal length of exposure to coloring gases and it is a foregone conclusion that such crops will show considerable decay on arrival at market or rot on

(Continued on page 24)

Effect of Lead Arsenate Insecticides on Orange Trees In Florida

(Continued from last month)

In the present work the rate of respiration was measured by determining the quantity of carbon dioxide liberated in a closed jar at a constant temperature, 25° C. (77° F.). The gas, carbon dioxide, was absorbed in sodium hydroxide solution (tenth normal) and titrated against hydrochloric acid (tenth normal) by the use of the double-indicator method.

When a test was made, twigs having from three to five leaves were cut under water, and the cut end was put in a vial of water. During the 2-day run the whole assembly was kept in a jar with the sodium hydroxide in the bottom. The sodium hydroxide was titrated once daily. The entire experiment was run in a dark room, and the twigs were kept at a temperature that varied less than one-half degree during the time of the experiment. After each run was completed, the area of leaves used was determined by a planimeter, and the weight of carbon dioxide liberated per square inch per 24 hours was used in comparison. In all cases the determinations were made in triplicate and the mean of the three used. The results of these observations are shown in Table 7.

As can readily be seen, water-soluble arsenic in very small quantities increases respiration. When only enough arsenic is present on orange leaves to stimulate respiration 5 to 19 per cent (less than 0.01 mg soluble arsenic trioxide on 10 g of green leaves) there is no injury; the leaves even become more glossy and take on a more intense shade of green. When the quantity is increased the stimulation is increased in direct proportion, and when the stimulation goes from 50 to 75 per cent above normal the leaves become yellow, and when the quantity is increased beyond that point the leaves usually drop.

When compounds of arsenic of different solubility were used, as when lead arsenate was compared with some form of a soluble arsenic compound, such as sodium arsenate, it was found that the stimulation was in direct proportion to the quantity of soluble arsenic on the leaves.

It has been pointed out that arsenic remains on trees for long periods after the spraying has been done. It is here shown that when soluble arsenic is present on citrus leaves the respiration is stimulated. Other experiments extending over the entire growing season have shown that the respiration of arsenical-sprayed trees was constantly stimulated as long as lead arsenate was present on the leaves.

Effect of Arsenicals On Catalase Activity of Orange Leaves

One of the standards used recently as a measure of the state of growth or condition of plants is the quantity of catalase present. In general, other workers have found that leaves that are growing vigorously show a high catalase content as compared with those that are yellow or are growing poorly. Determinations were made both on a small scale from twigs sprayed by hand and from the trees that were given normal applications in the field.

The quantity of oxygen liberated from hydrogen peroxide by the catalase of the leaves was used as an index of the catalase activity. In making this determination five disks 1 cm2 each were cut from leaves washed in tap and distilled water and ground to a smooth paste with an equal quantity of calcium carbonate (CaCO3) and a few drops of water. This was washed into a flask with 15 to 20 ml of distilled water and allowed to stand at 25° C. (77° F.) for one hour. Then it was connected to the apparatus where 20 c c of neutralized hydrogen peroxide (H2O2) was introduced and the quantity of oxygen evolved in five minutes measured at one-half minute intervals. All the determinations were made in a water bath at 25° C.

The quantity of soluble arsenic on the leaves from which the disks were taken was determined by the Gutzeit method. The results of the experiment are shown in Table 8.

It can readily be seen that the catalase activity changes according to the quantity of soluble arsenic present. The lighter application stimulated the catalase activity. When quantities less than 0.05 mg of soluble arsenic trioxide on 10 g of green leaves were present the catalase activity was increased. In heavy applications, where the arsenic trioxide ranged from 0.255 to 10.00 mg, catalase activity was decreased or entirely stopped. In these cases the leaves were usually injured so badly that they fell. Extensive experiments showed that catalase activity could be increased not over 10 per cent and no injury result. Such stimulation usually followed the presence of about 0.01 mg of soluble arsenic trioxide per 10 g of green leaves. The quantity that caused the most favorable stimulation of respiration caused the most favorable stimulation of catalase activity also.

Relation Between Leaf Processes and Condition of the Fruit

The relation between the respiration of orange leaves during the growing season and the percentage of acid in the mature fruit is very definite. The respiration was measured several times during the growing season, and the average increase or decrease over the check was recorded in terms of per cent. The acid was determined at maturity and considered as a per cent increase or decrease over the check. The check in each case was the unsprayed part of the same tree from which the respiration studies and fruit analyses had been made. This relation is shown in Table 9.

As can quite readily be seen, when the respiration is increased the acid in the fruit is reduced.

Besides the relation between the acid and respiration, there appears to be an agreement between the catalase activity of the orange leaves and the soluble-solids content of the fruit juice at maturity. Table 10, indicating this relation, shows a maximum increase in soluble solids of 1.5 per cent. Differences as small as this, however, should be the result of many determinations under various conditions before they can be considered significant.

Effect of Arsenicals on Oranges When Leaves and Fruit Were Sprayed

As stated previously, it has been known for a considerable time that arsenic greatly changed fruit composition. In order to determine just how much effect various quantities of arsenic did have on fruit composition many analyses have been made both of the insecticide on the tree during the growing season and at

the fruit at various stages of development. In most cases only the total quantity of arsenic remaining on the leaves and the composition of the fruit at maturity are shown.

Method of Making Determinations

The hydrogen-ion determinations were made by means of a Welch quinhydrone apparatus. Early in the season, when the fruit was small and the quantity of juice was insufficient for a titration, a half fruit was covered with quinhydrone and the contact and bridge placed in the macerated material. When the fruit contained more juice the acid determinations were made by titration against sodium hydroxide (0.156 N) and the soluble solids determined by a Brix hydrometer. The latter methods are the standard methods used for making the maturity determinations called for by the State laws of Florida. The results of these analyses are shown in Table 11.

Hydrogen-ion Concentration

There was a very definite relation between the hydrogen-ion concentration of fruit at maturity and the quantity of arsenic used on the tree.

Acid in Fruit Juice

Small quantities of arsenic reduced the acid in oranges very decidedly. When as much as 0.01 mg of arsenic (as arsenic trioxide) was left on 10 g of leaves at maturity, which was the quantity that would probably be left after a spraying of 8 ounces per 200 gallons of water, the maximum change was produced. Ten or one hundred times this quantity made no appreciable difference on the acid content of the fruit.

Soluble Solids in Fruit Juice

Gray and Ryan state that the sugars in fruit were not significantly changed, but work by Juritz showed that there was a considerable decrease in sugars. While these points are apparently in disagreement, the data indicated that widely different quantities of arsenic were used by the two workers. Copeman stated that the sucrose was decreased but that there was no significant change in the total sugars. In the Florida work it was found that a very slight quantity of arsenic, 0.004 to 0.008 mg of arsenic trioxide, reduced the acid in the fruit juice considerably; the same quantity actually increased the soluble-solids content in fruit at maturity. When more than this quantity of arsenic was present on leaves at maturity the soluble solids were reduced in direct proportion to the quantity of arsenic present. When as much as 1 mg was present at maturity there was approximately a 10 per cent reduction in the soluble-solids content of juice of mature fruit.

Ratio of Acid to Soluble Solids

Since the effect of 0.008 mg of arsenic trioxide on orange leaves at fruit maturity was shown in the reduced acid content of fruit juice and slightly increased soluble-solids content, the ratio of acid to solids was obviously changed. When more than this quantity of arsenic was present the solids were decreased; but because of a very great decrease in the acid also, the ratio was sometimes extremely high.

The writers are of the opinion that the fruit composition is changed only when the majority of the actively growing leaves on the tree at the time the fruit is growing have arsenic on them. For example, when arsenic was applied only to the old leaves of an orange tree it produced no effect, but later when it was applied to the young leaves the fruit composition was changed considerably. When lead arsenate was applied as late as eight months before some Temple oranges were analyzed and only the old leaves were present, there was no effect on the fruit composition, but where the new leaves had appeared before the lead arsenate was applied there was a very marked change in the composition of the fruit. When the leaves that have arsenic on them drop from the tree their effect on the fruit will be lost. If this happens during the first season, the next crop will be normal, but if the leaves stay on for more than a year the next crop will be affected also.

Arsenical Analyses of Fruit Juice

Only a trace of arsenic was found (4) in a liter of orange juice when a tree had been given thirteen 1-quart applications of fruit-fly bait spray at 10-day intervals. This mixture contained 8 pounds of lead arsenate per 200 gallons. Eighteen daily applications of lead arsenate of the same qauntity and the same strength were applied with the same result.

Arsenic as arsenic trioxide (As_2O_3) was found to the extent of 0.01 to 0.16 mg per liter of juice when 17 applications of 5 gallons of bait spray were made at 10-day intervals. Since the quantity of arsenic found in a liter of juice when the trees were very excessively sprayed was only a small fraction of a minimum medicinal dose, the juice from fruit trees normally sprayed could be in no way toxic for human consumption.

(Concluded next month)

Clothes of dark and cool colors like blues, grays and greens make large people appear smaller.

HIGHEST RETURNS SHOWN BY CITRUS

(Continued on page 23)

Temple orange is gaining a strong foothold in some markets. The Peerine lemon may have possibilities in many parts of this state.

The future of citrus fruit in Florida looks good. This is the time for all interested parties to combine their efforts, their brain power and their money to the end that our citrus industry be economically carried forward.

WHAT OUR READERS THINK

(Continued from Page 6)

of us in leadership and organization in the citrus industry as we are ahead of the platter-lipped women in Africa in living standards. This of course is the fruit of the grower and shipper alike.

We do believe that Florida fruit, which both the grower and shipper has for years tried to keep up to quality and improve at every opportunity, deserves to leave this State in a standard container.

You will not find Bulova watches in paper bags, and even the dime store will put a 25c watch for a kid in a little box. Outside of the fact that these trucks pay nothing towards the maintenance of our roads, we believe that the fruit merits a little better treatment.

We earnestly and sincerely believe that one of the most important acts that the present session could pass would be an act forbidding the transportation from this State of fruit in anything but an accepted standard container. If you would lend your good offices to such a move we believe that at some time in the not far distant future the Citrus Industry of the State would show her appreciation.

With kindest personal regards, we are,

Yours very truly,

BRACKEN FRUIT COMPANY

The United States turns out one-third of the world's total output of leather.

If baked potatoes are slit or pricked as soon as they are cooked, they are not likely to be soggy.

Milk supplies the best protein known to nature.—Dr. Walter H. Eddy.

Preliminary studies show that Florida fruits and vegetables contain fairly high percentages of iodine.

SOME FACTORS INFLUENCING DECAY IN FLORIDA CITRUS FRUITS

(Continued from page 20)

the merchant's hands unless special preventive measures are taken in handling the fruit after harvest.

It is doubtful whether the average crop today has as good carrying quality as it had some ten or more years ago, if for no other reason than because of the increase in the average age of our groves, with consequent increase in the amount of dead wood and sources of stem end rot infection.

Harvesting and Post-Harvest Factors

During the past ten or fifteen years some marked improvements have been made in the handling and transportation phases of the citrus industry, but much remains to be accomplished.

I. Some years ago it was not uncommon to find 20 or 30 percent of the fruit with clipper cuts and long stems. Much of the fruit in those days rotted with blue or green mold. Formerly clippers of the scissors type were in general use, but latterly a new type of clipper with a shorter cutting edge has been introduced, the use of which practically eliminates clipper cuts and long stems. In former years, the field box was filled too full, mainly because the grower or the buyer wanted a record packout. This caused a few fruits in each box to be crushed or box bruised. Such injured fruit decayed quickly with blue mold. This practice of over filling boxes is still all too common, but it probably does not cause as much decay as it once did.

II. Recently the use of borax in the washing operation has become general. This, coupled with more generally careful handling, has reduced blue mold decay from its once foremost rank to a relatively minor one.

III. More recently it has been demonstrated that if the fruit is given a borax bath before coloring the rate of stem end decay is greatly reduced. But, if the application of borax is deferred until after the coloring period, the reduction is not nearly so marked. For best results a borax deposit apparently must be left on the fruit during the coloring period. It seems desirable to use a concentration of at least 5% or 6% borax, possibly a little stronger might be still more effective. While the use of borax before coloring is an effective aid in checking stem end decay, it should not be expected to take the place of care in operating coloring rooms.

IV. The operation of the coloring room is an important factor in decay development. Fruit colored in the most approved manner is likely to decay more rapidly than similar fruit that is not subjected to the high temperature and humidity necessary for the coloring operations. Coloring is a major operation and at best it is a heroic treatment. The careless operation of coloring rooms can easily result in a considerable loss in packout through wilting effects or in decay. In the case of weak fruit or of that from older trees pretty well pepped up with stimulating plant food, decay is likely to develop quickly even if the coloring is done carefully.

V. Any unnecessary loss of time in getting the fruit from the tree to the precooler or refrigerator car is also an important factor in decay development. Organisms of decay develop rapidly at room temperature and above, particularly in weak fruit that has been colored in the usual way.

VI. The principal decays of citrus fruits develop relatively slowly at temperatures around 50 degrees — so slowly that it seems possible that this temperature may be used in connection with the export shipment of grapefruit. At this temperature grapefruit is not nearly so likely to develop storage scald or pocks as if stored at the lower temperatures which have been used heretofore. For best results the fruit should be brought to the desired temperature as quickly as possible after removal from the tree.

ECONOMIC FACTS RELATIVE TO THIRTY-THREE GROVE CARETAKING BUSINESSES FOR 1929

(Continued from page 9)

averaging 124 acres per business, the acres of grove cared for per work animal was 46, per tractor 177, per truck 124, per power sprayer 130, and per duster 275. See Table 5.

Not all of the businesses had each item of equipment, particularly was this true for the smaller businesses. There were three of the smaller and two of the medium size businesses that did not own tractors. Likewise, they did not all own power sprayers and dusters. But in the larger group of businesses, practically every item listed in Table 5 was found among the equipment of each caretaker. Thus there are indications that the larger businesses were better equipped in some respects, although they cared for more acres per unit of equipment.

There were 39 acres for every 12 months of human labor accounted for, including regular and irregular labor, office help, field foremen, and other supervisors.

The group that cared for from 200 to 500 acres per caretaker had the largest acreage per man equivalent, while the group under 200 acres had the smallest acreage per man equivalent.

No doubt one of the chief causes of the development of the caretaking business has been that the equipment necessary effectively and economically to care for groves is entirely too costly for one to own and operate on a small grove unit. The indications are that spray machines, dusters, tractors, trucks, and cultivators are capable of caring for a considerable acreage without being taxed to capacity, and for one to own such equipment to care for only 5, 10, or 20 acres of grove is practically prohibitive.

TABLE 5.—Average Number of Acres in Grove Cared for by 33 Caretakers in Lake and Polk Counties Per Important Item, 22,935 Acres, 1929.

Item	Under 500 Acres	200-500 Acres	Over 500 Acres	Average For The 33
Number of Records	10	12	11	33
Acres Per Caretaker Business	124	311	1,633	695
Man Equivalent *	29	52	58	39
Work Animal	46	89	88	84
Tractor	177	339	418	376
Truck	124	278	528	425
Two-Horse Wagon	112	178	283	210
One-Horse Plow	41	89	131	120
Two-Horse Plow	154	467	749	573
Two-Horse Disc Harrow	177	747	946	740
Two-Horse Acme	124	207	321	273
Tractor Acme	309	339	691	559
Mower	154	339	419	370
Power Sprayer	138	311	382	335
Power Duster	248	373	856	646
Hoe	20	41	63	52
Shovel	27	69	88	75
Acres Per Grove Owner	16	17	14	14

* Man equivalent represents 12 months of human labor accounted for on the payroll, including supervision, office help, regular and irregular labor.

Rising prices of farm products carried the farm price index of the Bureau of Agricultural Economics to 53 as of April 15—up 3 points since March 15, and to the highest figure since last November. The index on April 15 a year ago was 59. The bureau notes that changes in wholesale pricss of farm products at the large terminal market centers indicate further advances in prices paid farmers since April 15.

In writing advertisers please mention The Citrus Industry.

INSECT CONTROL ON CITRUS SIMPLIFIED BY NEW DISCOVERY

Gainesville, Fla.—A greatly simplified program of insect control in the citrus grove is in the making, says E. F. DeBusk, extension citriculturist. He believes that growers who spray for rust mites can add a pound of iron sulphate to 50 gallons of liquid lime-sulphur and greatly lengthen the time during which the spray will be effective.

Basing his suggestion on work done during the last two years by W. W. Yothers and Dr. R. L. Miller at the United States Department of Agriculture laboratory at Orlando, Mr. DeBusk believes that it will be possible to spray with the lime-sulphur and iron sulphate in early May, and the spray will remain effective until the summer rains start in July. Repeated tests by these entomologists have shown that the 1 pound of iron sulphate in 50 gallons of lime-sulphur doubles the effective life of the spray. It also lessens the danger of burning.

The addition is made at a cost of about one-fifth of a cent a tree for each application, says Mr. DeBusk.

RURAL COMMON SENSE

By Spuds Johnson

Industry, Agriculture Should Cooperate For Best Interests of Both

An era of better human relationships, with agriculture and industry working together as a team, with the load equally divided between them, was proposed recently by Secretary of Agriculture Wallace, in speaking before the United States Chamber of Commerce. The Secretary declared that he had no sympathy with attempts to set class against class—farmers against anybody else, or anyone else against farmers. "It is not only justice, but intelligent self-interest to restore reasonable purchasing power to agriculture," he declared.

"The last three years have been long years, but at least they have had the value of showing us the defects in our economic and social machinery. Now I wonder whether we are ready to profit by our experience.

"From the old era of the heedless expansionist and the rugged indivdualist, I think we are ready to turn to a new era of better human relationships, with emphasis less on production than on equitable distribution of the fruits of production. We can, if we will, grant to the city laborer and to the farmer alike that higher standard of living which logically belongs to them as a result of their increased productive efficiency.

"We have had enough ruthless competition. A people wait, with hopes higher than they have been in years, for a new spirit to control our economic relations, the spirit of even-handed justice.

"Let agriculture and industry from now on travel in double harness, as a team with the load equally divided between them."

Industry cannot prosper over much unless there is also a prosperous agriculture in the country, and certainly agriculture cannot attain very high standards of living without an industrial market for its products. It is to be hoped, as the Secretary said in closing, that we are now entering "an era of better human relationships."

NEGROES PLANT GARDENS

Gainesville, Fla. — More than 80 colored families in Alachua County have recently planted home gardens and two community gardens have been set. The seed and fertilizer were furnished by the Florida Emergency Relief Administration, and the gardens were planted under the supervision of V. L. Postelle, local negro farm agent.

Bills for fresh fruits and vegetables, as well as eggs and milk, are cheaper than doctors' bills, and it's much more fun paying them.

Paint brushes which become hardened may be readily softened by boiling in vinegar for 15 minutes.